

Exploring the Effects of Teacher Job Satisfaction on Teaching Effectiveness:

Using 'Teaching Quality Assurance' as the Mediator

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Abstract

The purpose of this study is to verify the effects of job satisfaction of lecturers or higher-level teaching staff on teaching effectiveness at three particular Taiwan-based technological and vocational colleges, with "teaching quality assurance" being the mediator. This study interviewed lecturers or teachers selected by way of simple random sampling who hold higher positions at three particular Taiwan-based technological and vocational colleges. Linear Structural Equation Modeling (SEM) was employed to verify the goodness-of-fit of the overall model, structural model and measurement model, followed by an examination of mediating effects using the Sobel Test, Bootstrapping and the Mackinnon PRODCLIN 2 program. The research results suggest that, at these particular Taiwan-based technological and vocational colleges: (1) teacher job satisfaction has a positively significant effect on teaching quality assurance; (2) teaching quality assurance has a positively significant effect on teaching effectiveness; and (3) teacher job satisfaction has a positively significant effect on teaching effectiveness. Apparently, teaching quality assurance has no more than a partial mediating effect and, as this study implies, is not the sole silver bullet for increased teaching effectiveness which actually can be achieved by bolstering the teachers' job satisfaction.

Keywords:

Teacher Job Satisfaction; Teaching Effectiveness; Teaching Quality Assurance

Research Motivation and Purposes

Despite the noticeably declining enrollment in Taiwanese technological and vocational college due to

a lower birth rate, the number of universities/colleges has been surging in recent years, leading to an imbalance between supply and demand of higher education that has prompted some school boards to assess the educational performance of teaching staff. The initially well-intended teaching assessment program has, nevertheless, become a tool for colleges to discharge teachers, with or without severance payments. On the other hand, teachers seeking survival are forced to work in an all-purpose manner as an instructor, counselor, researcher and servicer, paying attention to every detail every day lest they should lose their job. Many of the college teachers, who tend to focus all day long on corporate-sponsored academic programs and research projects, have inevitably developed a questionable attitude toward teaching. That is a predicament underscoring the extreme importance of solving educational problems in this regard.

Consequently, many schools started implementing required programs of teaching quality assurance which is a critical criterion of universities' educational performance assessments. How the quality assurance indices are established/administered (and how effective the teaching practices are) would be closely linked to the workplace competitiveness of all college graduates, regardless of the academic major. Although such indices are immediately tied to students' development of core competitiveness, teachers' job satisfaction affects, either directly or indirectly, the results of an ongoing program of teaching quality

assurance, which may in turn affect the teaching effectiveness.

Consequently, the relationships among teacher job satisfaction, teaching effectiveness and teaching quality assurance constitute a very important topic for research nowadays that prompted this study to look into and verify how the job satisfaction of lecturers or higher-level teaching staff at three particular Taiwan-based technological and vocational colleges affects teaching effectiveness, with "teaching quality assurance" being the mediator. The purposes of this study are specified as follows:

1. To verify and understand whether the job satisfaction of lecturers or higher-level teaching staff at three particular Taiwan-based technological and vocational colleges has a significantly positive effect on teaching quality assurance;
2. To verify and understand whether the teaching quality assurance of lecturers or higher-level teaching staff at three particular Taiwan-based technological and vocational colleges has a significantly positive effect on teaching effectiveness;
3. To verify and understand whether the job satisfaction of lecturers or higher-level teaching staff at three particular Taiwan-based technological and vocational colleges affects their teaching effectiveness positively.

Literature Review

Literature concerning teacher job satisfaction

Ren (1985) defined an elementary school teacher's job satisfaction as his/her subjective feelings or emotional responses toward the teaching job itself, the work environment, the supervision/guidance of school president, the reward and the changeable nature of the job. He concluded that the smaller the gap between expected and actual reward is, the greater the job satisfaction is, and vice versa.

According to Hsu (1977), job satisfaction is a worker's feelings toward, or emotional responses to, his/her job.

Wu (1979) noted job satisfaction is a person's level of aggressive and affective orientation toward his/her current job descriptions.

Wu (1980) defined job satisfaction as a worker's perceived sum of the difference between his/her

expected and actual satisfaction derived from the job.

Chang (1992) argued that job satisfaction was the extent to which a person, or a majority of an organization's employees, was satisfied with the job assigned.

As defined by Li (2002), job satisfaction was a person's attitude and affective responses regarding his/her current job descriptions, combined with the general feelings and subjective value judgment about the job-specific personal history. Whether or not a worker was satisfied with the job depended on the gap between actual and expected value he/she derived from a particular workplace: the smaller the gap is, the greater the job satisfaction is.

Chen (2003) said job satisfaction was a worker's emotions/feelings regarding the job itself (and every aspect of it); and it was also the worker's perceived gap between the expected and actual satisfaction he/she derived from varied aspects of the job; the smaller the gap is, the greater the job satisfaction is.

According to Huang (2005), job satisfaction referred to the subjectively and emotionally perceived satisfaction derived from a worker's opinions about his/her job-specific experience, which could be general or specific, positive or negative. Such a display of emotions depended on the gap between a person's expected values generated by all aspects of the job (i.e., the job itself, job history, job outcomes, job-specific experience, job roles and workplace) and the actually generated values: the smaller the gap is, the greater the satisfaction is.

Apparently, scholars have different concerns with regard to the definition of job satisfaction. In this study, job satisfaction is conceptually defined as "an individual teacher's subjective feelings or emotional responses regarding the teaching job itself, the work environment and the reward for teaching job; the smaller the gap between the expected and actual reward is, the greater the job satisfaction is, and vice versa." With a focus on lecturers or higher-level teaching staff at three Taiwan-based technological and vocational colleges, this study measures job satisfaction in the three perspectives proposed by Huang (2005), namely the "job history and outcomes," "job-specific experience" and "job roles and values."

Literature Concerning Teaching Quality Assurance

Technological and vocational colleges across the country are keen to promote or implement teaching

quality assurance programs, although literature in this regard remains hardly available. Listed below are some studies related to teaching quality assurance and appear in Yahoo search results.

The teaching-quality assurance practices adopted by Chaoyang University of Technology (2011) helped its students' develop four core competencies, namely the "professional and practical capabilities," "the ability to apply information technologies," "the capabilities as a communicator, negotiator and team-worker" and "the ability to engage in self-initiated learning." In other words, such practices are designed to nurture highly qualified talent by equipping students with both expertise and work ethics, and subsequently to accomplish the school's educational goals, or mission, that ensure students *to find a job right after graduation or practice competence right after being employed*.

According to the Articles of Organization for Feng Chia University Center for Teaching Quality Assurance (2008), this Taiwan-based center is largely in charge of five tasks: (1) managing the teaching quality and quantity control mechanism; (2) implementing assessments and certification efforts for academic units; (3) making improvements based on the assessment results and follow-up management; (4) conducting assessments for learning and/or for teachers' performance; and (5) making any other effort that contributes to the teaching quality. Feng Chia University promotes its teaching quality assurance program with the goals/mission of nurturing talent by equipping students with both expertise and work ethics, which is intended to bolster their employment rates.

Meanwhile, the Department of Marketing Management of Takming University of Science and Technology (2012) announced the core competencies required for its students: (1) expertise in sales and industry-specific marketing channels; (2) marketing management and market analysis abilities; (3) the ability to harness information technologies required in the workplace; (4) corporate ethics and teamwork abilities. Through these core competencies and their indices, the department hopes to nurture highly qualified talent by equipping students with expertise as well as work ethics.

Apparently, schools or academic units across Taiwan categorize the components of teaching quality assurance in a much similar way. To sum up the views of the above-mentioned schools or academic units, this study conceptually defined teaching quality assurance

as "an effort to nurture highly qualified talent by equipping students with expertise as well as work ethics, in hopes of increasing their core competitiveness and eventually accomplish the school's educational goals, or mission, that ensure all students *to find a job right after graduation or to practice competence right after being employed*." While focused on three Taiwan-based technological and vocational colleges, this present study's author was inspired by the practices of Chaoyang University of Technology (2011) to measure teaching quality assurance in four perspectives, namely the "professional and practical capabilities," "the ability to employ information technologies," "the capabilities as a communicator, negotiator and team-worker" and "the ability to engage in self-initiated learning."

Literature Concerning Teaching Effectiveness

In fact, teaching effectiveness is inseparable from learning effectiveness: the former addresses the results of a teacher's instructional approaches (from the teacher's viewpoint) and the latter that of a student is learning (from the student's viewpoint). Given the scarce availability of literature concerning teaching effectiveness, studies with regard to learning effectiveness (already published worldwide) are cited in the following paragraphs.

The term "learning effectiveness" refers to changes in the learner's knowledge, skills, and attitude after an instructional session (Chiou, 1992; Piccoli et al, 2001).

As noted by Wang (2001), learning effectiveness is affected by the learning pattern, curriculum design, and instructional approaches.

Chien (1999) conducted a study and found a significant difference in learning effectiveness among different learning patterns, although that difference has become less significant with the use of multi-media teaching aids. Apparently, interactive multi-media teaching aids help reduce the effect of different learning patterns on learning effectiveness. That is, interactive multi-media teaching aids help teachers adapt to the students' varying learning styles and thus reducing the effect of learning patterns on a learner (Wang, 2001).

According to Shi (2006), learning achievements are values derived from well-guided, well-intentioned, and organized learning behavior.

Yu (2006) said the notion of learning achievements was similar to those of academic achievements,

academic records, academic performance, or average academic grades. He added that the definition of learning achievements, in a broader sense, included any learning record of a student while he/she was enrolled in the school (e.g., assignments, quizzes, mid-term and final exams results). Learning achievements in a narrow sense, however, are defined as the semester grades in every academic discipline, or the average score of academic exams in all disciplines.

Chang (2006) argued that learning is a long process where an individual's knowledge/behavior changes through persistent practices or experiences, while the term achievements referred to results of a person's efforts to diligently acquire knowledge on the basis of inherent/genetic qualities; such results were tangibly displayed in a particular aspect. Chang said that achievements include: (1) the ability to successfully reach the desired goals through personal or group actions; (2) the ability to reach a given standard (such as winning an award) or status (such as earning a degree) of success in a specific domain (e.g., a field of learning); (3) academic achievement test scores or scores earned for occupational attainments; and (4) a student's academic records when enrolled in the school.

According to the criteria stated by the Department of Marketing Management of Takming University of Science and Technology (2012), the indices to measure a teacher's teaching effectiveness are: (1) the obtained number of vocational certificates; (2) placement in competitions; (3) the executed number of projects; (4) students' employment rates.

Apparently, scholars have different concerns with regard to the categorization of teaching or learning effectiveness, and this study conceptually defined teaching effectiveness as "a learner's changes in knowledge, skills, and attitude after an instructional session, which also provides an index to measure the learning outcomes of students." With a focus on lecturers or higher-level teaching staff at three Taiwan-based technological and vocational colleges, this study was inspired by indices proposed by the Department of Marketing Management of Takming University of Science and Technology (2012) to measure teaching effectiveness in four different perspectives/dimensions: (1) the number of vocational certificates obtained; (2) the placement in competitions; (3) the number of projects executed; and (4) students' employment rates.

Literature Concerning the Relationship between Teacher Job Satisfaction and Teaching Quality Assurance

Despite the unavailability of literature concerning teacher job satisfaction and teaching quality assurance, we may boldly derive the following hypothesis from studies mentioned in Sections 2.1 and 2.2 (which address teacher job satisfaction and teaching quality assurance respectively, and share some viewpoints even if they do not discuss the same academic unit): H₁: The job satisfaction of lecturers or higher-level teaching staff at three particular Taiwan-based technological and vocational colleges has a significantly positive effect on teaching quality assurance.

Literature Concerning the Relationship between Teaching Quality Assurance and Teaching Effectiveness

Despite the unavailability of literature concerning teaching quality assurance and teaching effectiveness, we may boldly derive the following hypothesis from studies mentioned in Sections 2.2 and 2.3 (which address teaching quality assurance and teaching effectiveness respectively, and share some viewpoints even if they do not discuss the same academic unit):

H₂: The teaching quality assurance of lecturers or higher-level teaching staff at three particular Taiwan-based technological and vocational colleges has a significantly positive effect on teaching effectiveness.

Literature Concerning the Relationship between Teacher Job Satisfaction and Teaching Effectiveness

Despite the unavailability of literature concerning teacher job satisfaction and teaching effectiveness, we may boldly derive the following hypothesis from studies mentioned in Sections 2.1 and 2.3 (which address teacher job satisfaction and teaching effectiveness respectively, and share some viewpoints even if they do not discuss the same academic unit):

H₃: The job satisfaction of lecturers or higher-level teaching staff at three particular Taiwan-based technological and vocational colleges has a significantly positive effect on teaching effectiveness.

FIGURE 2.1 shows the research framework derived from the aforementioned research purposes, hypotheses, and literature review:

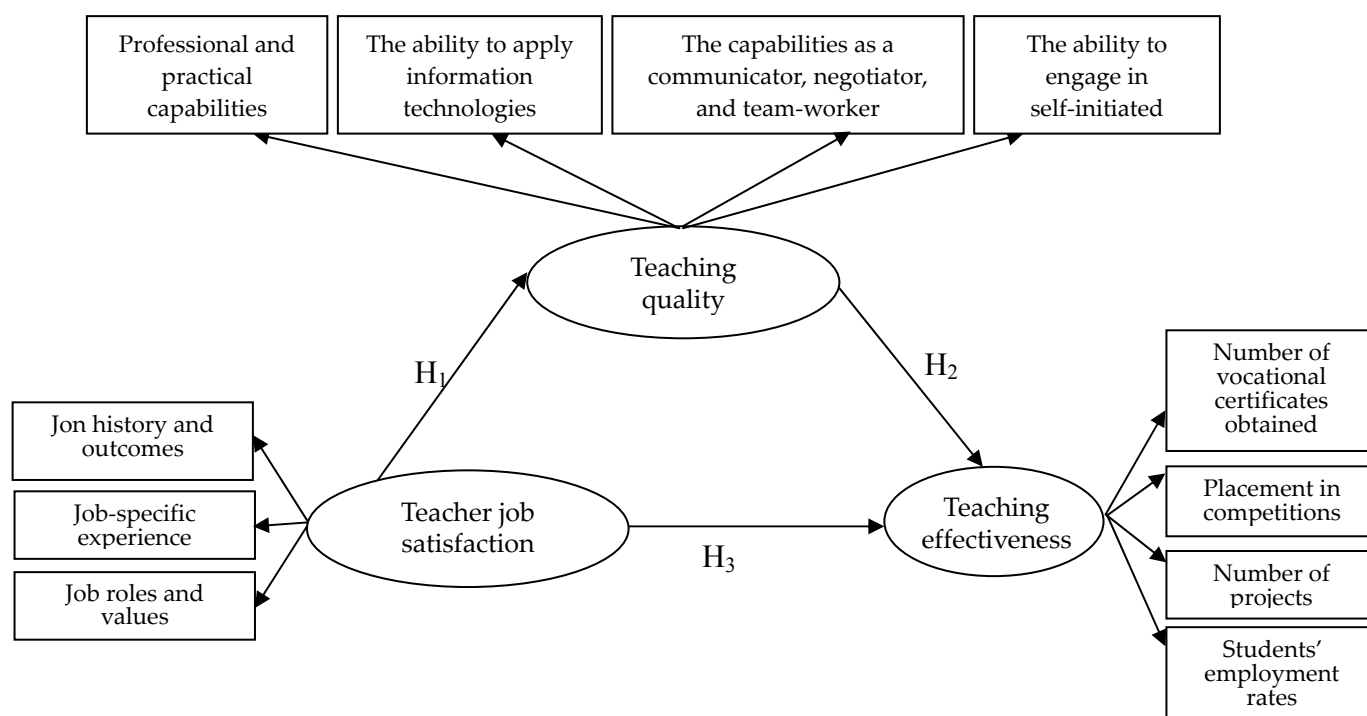


FIGURE 2.1 THE RESEARCH FRAMEWORK

Research Method

Designing the Questionnaire and the CMV Testing

1) *Designing the Questionnaire*

Respondents of questionnaire survey in this study were selected by simple random sampling. For better content validity and reliability, copies of expert questionnaire were given out after the questionnaire was designed and before pilot-testing. After unsuitable items were revised or removed, 550 copies of questionnaire were sent via mail in a post-test to teachers holding lecturer or higher-level positions at three particular Taiwan-based technological and vocational colleges. 201 out of the 550 questionnaire copies given out were returned valid, hence the 36.5% valid response rate. Consisting of the observable perspectives mentioned earlier, the questionnaire was designed based on Multi-Dimension Measurement and all answers were measured on a 7-point Likert Scale, with 7 being Strongly Agree and 1 being Strongly Disagree. A higher score represents a greater degree of agreement, and vice versa.

The 12-item questionnaire of teacher job satisfaction was patterned after the one proposed by Huang (2005) to contain three perspectives: "job history and outcomes," "job-specific experience" and "job roles and values."

The 12-item questionnaire of teaching quality assurance was designed in line with the practices of Chaoyang University of Technology (2011) to contain four perspectives: "professional and practical capabilities," "the ability to apply information technologies," "the capabilities as a communicator, negotiator and team-worker" and "the ability to engage in self-initiated learning."

The four measurement indices for the 16-item questionnaire of teaching effectiveness were inspired by what Takming University of Science and Technology (2012) stated in its policy, namely the "number of vocational certificates obtained," "placement in competitions," "number of projects executed" and "students' employment rates."

2) *CMV Test*

This study had considered ways to lower the CMV ever since giving out questionnaire copies for a survey. After the completion of Confirmatory Factor Analysis (CFA), a Haman's single-factor test and a single-factor CFA (i.e., single-factor CMV test) were conducted to examine whether the CMV is problematic in any dimension. In other words, the chi-square difference testing was adopted to allow this study to at least declare an insignificant CMV in case of a statistically significant difference (Chang, 2011).

SEM and the Measurement System

Linear Structural Equation Modeling (SEM) was used in a CFA of this study's research framework. The questionnaire was constructed on the basis of three latent variables (i.e., teacher job satisfaction, teaching quality assurance and teaching effectiveness), each divided into sub-variables that contained several questionnaire items (as stated below). The collected data was processed to create a main file for the

questionnaire. As for the measurement model, this study designed the questionnaire using Multi-Dimension Measurement but adopted the Dual Measurement method to ensure successfully processed/measured data with the aid of computer software (Shun-yu Chen, 2010). TABLE 3.1 shows the number of questionnaire items under each implicit and explicit variable, along with the referential sources (Lee^a, 2011).

TABLE 3.1 QUESTIONNAIRE STRUCTURE AND NUMBER OF ITEMS BY PERSPECTIVE

Main Perspectives	Sub-Perspective (or measurement indices)	Total Number of Questions	Referential Sources
Teacher job satisfaction (X)	Job history and outcomes	4	Huang (2005)
	Job-specific experience	4	
	Job roles and values	4	
Teaching quality assurance (Me)	Professional and practical capabilities	4	Chaoyang University of Technology (2011)
	The ability to apply information technologies	4	
	The capabilities as a communicator, negotiator and team-worker	4	
	The ability to engage in self-initiated learning	4	
Teaching effectiveness (Y)	Number of vocational certificates obtained	4	Takming University of Science and Technology (2012)
	Placement in competitions	4	
	Number of projects executed	4	
	Students' employment rates	4	

TABLE 4.1 TEST RESULTS REGARDING FIT OF THE OVERALL MODEL

Indices		Standards of Judgment	Test Results
Measures of Absolute Fit	GFI	>0.9	0.901
	AGFI	>0.8	0.886
	RMR	<0.05	0.031
Incremental Fit Measures	NFI	>0.9	0.903
	CFI	>0.9	0.901
Parsimonious Fit Measures	PNFI	>0.5	0.663
	PGFI	>0.5	0.642

Linear Structural Model

This study conducted a CFA, an analytical approach contrary to the Exploratory Factor Analysis (EFA), on each pair of the three main perspectives (i.e., teacher job satisfaction, teaching quality assurance, and teaching effectiveness). Making up of structural and measurement models, SEM effectively addresses the cause-effect relations among implicit variables. Models in this study were verified in three regards: (1) whether the overall model conforms to the goodness-of-fit indicators; (2) goodness-of-fit of the measurement model; and (3) goodness-of-fit of the structural model (Lee^a, 2011).

Analyses and Results

1) Test Results Regarding Fit of the Overall Model

This study built the overall model framework following a literature review and a factor analysis of sample data and, as recommended by Hair et al. (1998), measured the overall model's goodness-of-fit in three different ways: the Measures of Absolute Fit, the Incremental Fit Measures, and the Parsimonious Fit Measures. The test results are listed in TABLE 4.1 (Chen, Fang, Chen and Chien, 2008).

2) Results and Analysis of CMV Test

A multi-factor CFA displays the nested structure of a single-factor CFA, which means the nested multi-factor CFA is a subordinate structure under the single-factor one. In this study, a chi-square difference test was conducted with the hypothesis of "there is little difference between the single-factor CFA model and multi-factor one (as shown in FIGURES 4.1 and 4.2)." The test results proved a difference between the two models, given the highly significant gap in their chi-square values, without any evidence that the CMV is present.

The test was conducted in the following steps:

- (1) A FIGURE of single-factor CFA was compiled to derive statistics such as the chi-square values, degree of freedom, and goodness-of-fit.
- (2) The FIGURE was revised according to the initial factor model (see FIGURE 4.2) before an analysis was carried out to derive statistics of another model, namely the chi-square value, degree of freedom and goodness-of-fit (Open

CMV multifactor.amw file).

- (3) Comparing the two models

$$\Delta df = 57 - 31 = 26; \Delta \chi^2 = 1268.541 - 188.552 = 1079.989$$

- (4) Calculating the statistical significance

By activating the STATABLW program, selecting *Distribution* → *Continuous* → *Chi-Square*, specifying the Δdf and $\Delta \chi^2$ and click on Enter, and we will obtain the p-value. The p-value in this study is 0, which indicates a highly level of significance that rejects the null hypothesis while proving the difference between the two models examined (see FIGURES 4.1 and 4.2). Apparently, it is impossible that CMV is present in any of this study's dimensions. The calculation of coefficients will not be biased because CMV is not a concern in the present study, which makes confusing explanations of research results unlikely.

3) Measurement Model

The factor loading measures the intensity of linear correlation between each item under the manifest/explicit variables (or sub-perspectives) and latent/implicit variables (or main perspectives). The closer the factor loading is to 1, the more capable an observable variable (or sub-perspective) is in measuring the main perspectives. The present study proves reliable with an above-0.7 factor loading in any sub-perspective. That is, all sub-perspectives (i.e., explicit variables) in the proposed measurement model properly measure the main perspectives (i.e., implicit variables). Meanwhile, the Average Variance Extracted (AVE) measures the unobservable/implicit variables' explanatory power of variance regarding observable ones; a higher AVE suggests greater reliability and convergent validity of an implicit variable. It usually takes an above-0.5 AVE to prove a perspective's explainable variance exceeding the measurement error (Fornell and Larcker, 1981). As AVEs in this study invariably exceed 0.5, the latent/implicit variables have excellent reliability and convergent validity (See TABLES 4.2, 4.3 and FIGURE 4.3). In this study, the discriminant validity among the model's dimensions is determined using the AVE method. Fornell and Larcker (1981) said there would be discriminant validity between dimensions when the AVE exceeds the square of correlation coefficients in each dimension. TABLE 4.3 proves the discriminant validity among this study's dimensions (i.e., teacher job satisfaction, teaching quality assurance, and teaching effectiveness).

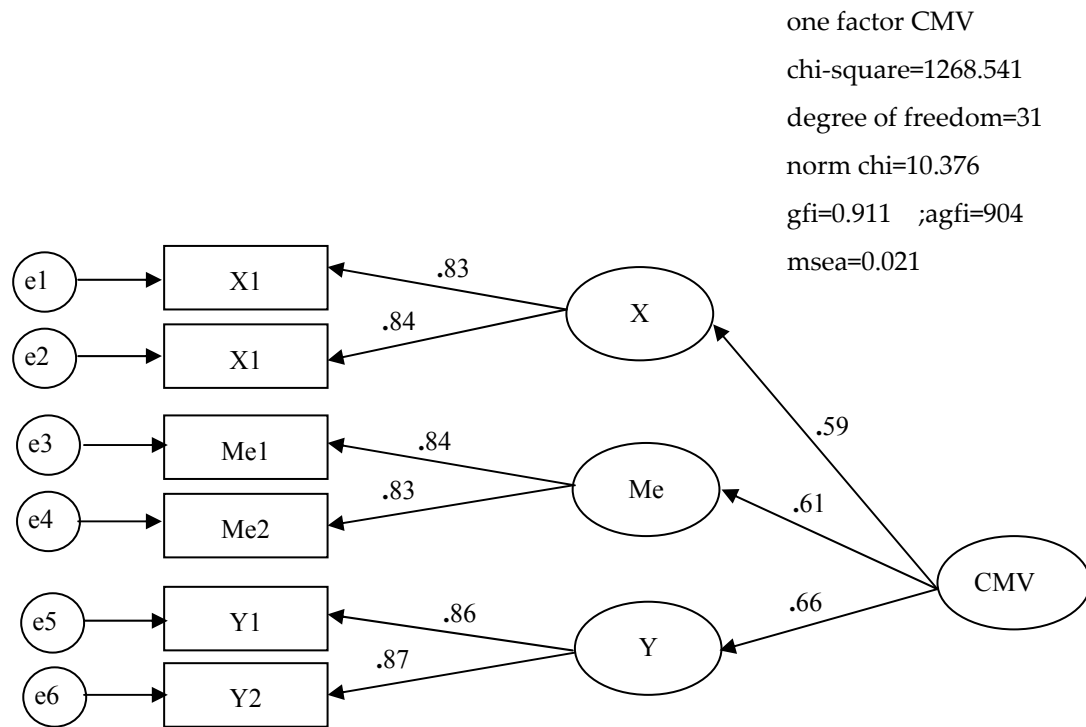


FIGURE 4.1 SINGLE-FACTOR CFA

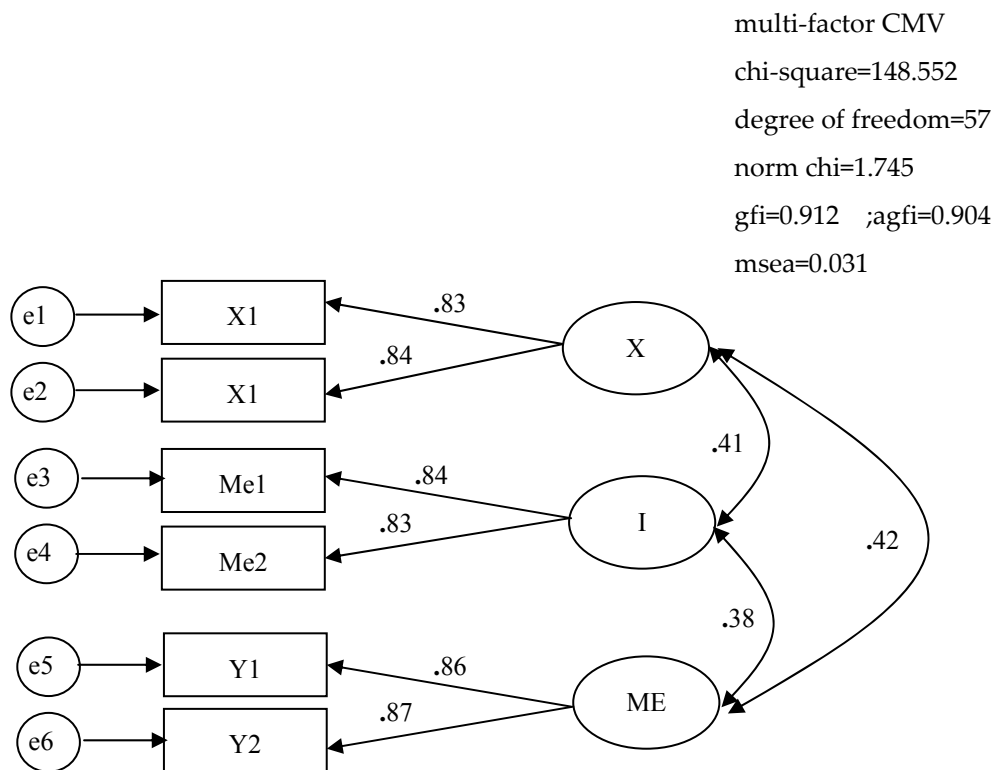


FIGURE 4.2 MULTI-FACTOR CFA

TABLE 4.2 JUDGMENT INDICATORS FOR THE MEASUREMENT MODEL

Standardized Regression Weights: (Group number 1 - Default model)

Implicit perspectives	Measurement indices	Factor loading	Composite Reliability (C. R.)	Cranach's α	Average Variance Extracted
Teacher job satisfaction (X)	Job history and outcomes	.842	.844	.843	.661
	Job-specific experience	.832			
	Job roles and values	.841			
Teaching quality assurance (Me)	Professional and practical capabilities	.843	.841	.834	.632
	The ability to apply Information technologies	.831			
	The capabilities as a communicator, negotiator and team-worker	.841			
	The ability to engage in self-initiated learning	.823			
Teaching effectiveness (Y)	Number of vocational certificates obtained	.861	.863	.861	.682
	Placement in competitions	.842			
	Number of projects executed	.862			
	Students' employment rates	.891			

TABLE 4.3 ESTIMATED VALUES FOR DISCRIMINANT VALIDITY WITHIN THE CONFIDENCE INTERVAL

Parameter	Estimate	$\Psi \pm 2\sigma$		Bias-corrected		Percentile method	
		Lower	Upper	Lower	Upper	Lower	Upper
X \longleftrightarrow Me	.581	.471	.672	.461	.664	.472	.663
Me \longleftrightarrow Y	.622	.531	.734	.524	.743	.521	.733
X \longleftrightarrow Y	.564	.484	.691	.481	.692	.484	.693

TABLE 4.4 PATH COEFFICIENT OF DETERMINATION

Coefficients of Determination	R ²
Teacher job satisfaction (X) \rightarrow Teaching quality assurance (Me)	.338
Teaching quality assurance (Me) \rightarrow Teaching effectiveness (Y)	.387
Teacher job satisfaction (X) \rightarrow Teaching effectiveness (Y)	.318

TABLE 4.5.1 (UN-STANDARDIZED) PARAMETER ESTIMATES FOR IMPLICIT VARIABLES

	Estimate	S.E.	C.R.	P
Teacher job satisfaction (X) \longrightarrow Teaching quality assurance (Me)	.998	.107	9.327	***
Teaching quality assurance (Me) \longrightarrow Teaching effectiveness (Y)	1.026	.102	10.059	***
Teacher job satisfaction (X) \longrightarrow Teaching effectiveness (Y)	.832	.096	8.667	***

Note: ***indicates a statistically significant C.R. value ($\alpha=0.001$)

TABLE 4.5.2 STANDARD REGRESSION WEIGHTS (GROUP NUMBER 1-DEFAULT MODEL)

	Estimate
Teacher job satisfaction (X) \longrightarrow Teaching quality assurance (Me)	.833
Teaching quality assurance (Me) \longrightarrow Teaching effectiveness (Y)	.821
Teacher job satisfaction (X) \longrightarrow Teaching effectiveness (Y)	.432

Note: * indicates $P<0.05$; ** indicates $P<0.01$; *** indicates $P<0.001$

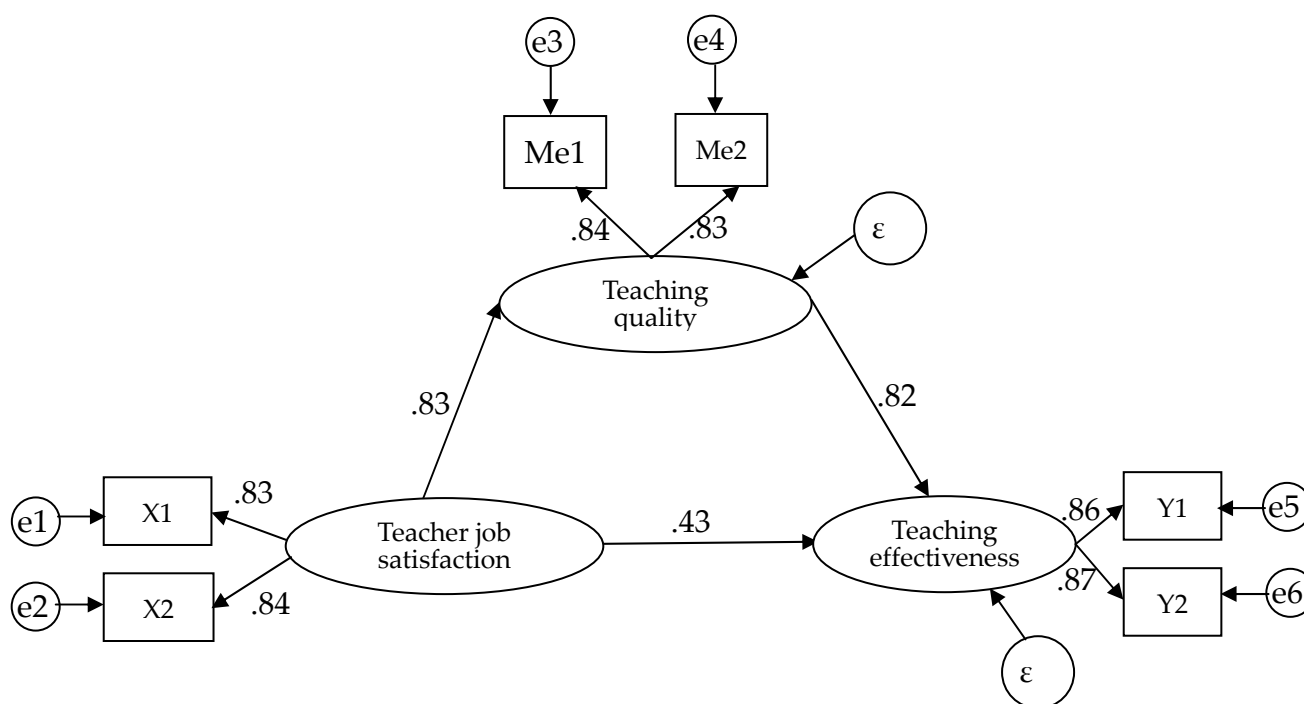


FIGURE 4.3 STANDARDIZED RESULTS OF SEM ANALYSIS

4) Coefficient of Determination

Also known as Squared Multiple Correlation (SMC), the Coefficient of Determination is an implicit independent variable's explanatory power regarding an implicit dependent one. In this study, such an explanatory power proves to be a medium-level one, as shown in TABLE 4.4.

5) Path Coefficient of Implicit Variables in the Model

After the mode passed an internal goodness-of-fit test, the estimates of standardized path coefficients and Critical Ratio (C.R.) for latent/implicit variables were calculated (see TABLEs 4.5.1 and 4.5.2). FIGURE 4.3 is an illustration of the path analysis

results

TABLE 4.6 SUMMARY OF RESULTS CONCERNING THE MEDIATOR VARIABLE

Variables	Point of Estimates	Product of Coefficients		Bootstrapping				MacKinnon	
				Bias-Corrected		Percentile		PRODCLIN2	
			95% CI		95% C		95%CI		
	(Est.)	SE	Z	Lower	Upper	Lower	Upper	Lower	Upper
X→Me	.833	.107	9.327	Total Effects				.263	.774
				.241	.962	.351	.912		
Me→Y	.821	.102	10.059	Indirect Effects					
				.152	.841	.133	.631		
X→Y	.432	.096	8.667	Direct Effects					
				.141	.721	.043	.842		

(Lee^b, 2011).

Analytical Testing of Path Effect for the Structural Model

Regarding the path coefficients for implicit/unobservable variables in the structural model, this study used Sobel Test, Bootstrapping and MacKinnon PRODCLIN2 to test the structural model's path effect, with teaching quality assurance (Me) as the mediator. TABLE 4.6 shows the test results (Sobel, 1982; MacKinnon, Fritz, Williams and Lockwood, 2007):

The following conclusions were derived from TABLE 4.5:

1. The job satisfaction of lecturers or higher-level teaching staff at the three particular Taiwan-based technological and vocational colleges exerts a positive and significant effect on teaching quality assurance with a 0.83 standardized path coefficient that supports H₁ (Hypothesis substantiated);
2. The teaching quality assurance of lecturers or higher-level teaching staff at three particular Taiwan-based technological and vocational colleges exerts a positive and significant effect on teaching effectiveness with a 0.82 standardized path coefficient that supports H₂ (Hypothesis substantiated);
3. The job satisfaction of lecturers or higher-level teaching staff at three particular Taiwan-based technological and vocational colleges exerts a

positive and significant effect on teaching effectiveness with a 0.43 standardized path coefficient that supports H₃ (Hypothesis partially substantiated);

4. The three conclusions stated above indicate a satisfying goodness-of-fit of the model established by this study. The teaching quality assurance of lecturers or higher-level teaching staff at three particular Taiwan-based technological and vocational colleges proves no more than a partial mediator, which echoes the argument of Baron and Kenny (1986) that the *partial* mediating effect occurs when an additional mediator results in a weaker, or less significant, relationship between independent and dependent variables (Lee^b, 2011).

Conclusion and Suggestions

According to the aforementioned analyses and results, this chapter specifies the conclusions and contributions of the present study. The research limitations and suggestions for future research are mentioned in the last passages.

Conclusions

In summary, the present study verified topics of interest using a SEM-based survey of teachers holding lecturer or higher-level positions at three particular Taiwan-based technological and vocational colleges. The conclusions are detailed as follows:

1) The Effects of Teacher Job Satisfaction on

Teaching Quality Assurance

The research results proved H_1 is substantiated (i.e., teacher job satisfaction has a significantly positive effect on teaching quality assurance).

2) The Effects of Teaching Quality Assurance on Teaching Effectiveness

The research results proved H_2 is substantiated (i.e., teaching quality assurance has a significantly positive effect on teaching effectiveness).

3) The Effects of Teacher Job Satisfaction on Teaching Effectiveness

The research results proved H_3 is partially substantiated (i.e., teacher job satisfaction has a significantly positive effect on teaching effectiveness).

Apparently, teaching quality assurance, as well-intentioned as it may be, has no more than a partial mediating effect and, as this study's findings implied, is not the sole silver bullet for increased teaching effectiveness which can be achieved also by bolstering teachers' job satisfaction. It is imperative that school directors of academic affairs consider the feasibility, but not only completeness, of measurement indices for education performance when determining the measurement indices for teaching quality assurance, otherwise their policy implementation may leave many teachers or students feeling tormented. After all, none of the teachers or students is perfect, and there is a cultural difference among schools or academic units.

Contributions of the Present Study

1. While previous studies of how teachers' job satisfaction affecting teaching effectiveness are hardly available and mostly EFA in nature, this study not only performed modeling according to the summary of literature review, but also verified the model for goodness-of-fit effects. In other words, the present study is a CFA-based one on important and innovative topics with regard to business practices; and it provides a reference for further research in relevant fields.
2. Also, this study includes a series of analyses/tests of reliability, validity and CMV in the design of questionnaire scales and modeling perspectives, using relatively new statistical methods. That explains why this study is innovative in terms of

research method.

3. Results of this study provide advice for technological and vocational colleges worldwide when making strategies about teaching quality assurance.

Limitations

This study completed each stage of the research process with limited resources and the greatest caution possible, despite the following limitations:

1. This study conducted a survey with simple random sampling and sent out questionnaire copies via mail, which led to a comparatively low response rate that might misrepresent the population, or the three particular Taiwan-based technological and vocational colleges.
2. The limited research resources forced this study to focus on the three particular Taiwan-based technological and vocational colleges, which may be not representative of nationwide similar school.
3. There is fewer literature exploring this study's topics and perspectives, either domestically or globally. As few researchers have discussed the pairing of perspectives based on which this study was constructed, there was not enough statistical evidence available to support this study's hypotheses.

Recommendations for Future Research

As a matter of fact, studies on the relations among teacher job satisfaction, teaching quality assurance and teaching effectiveness are applicable to students of all age groups and all academic majors, not only to Taiwan-based technological and vocational colleges. Since academic units with differing visions might disagree over the measurement indices for teacher job satisfaction, teaching quality assurance and teaching effectiveness, this study is focused on samples selected from lecturers or higher-level teaching staff at three particular Taiwan-based technological and vocational colleges. To ensure innovations/breakthroughs in data collection, future researchers might well extend this study to in-depth analyses/comparisons of teachers of various academic majors, or different student-age groups.

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